# CANADIAN GEOGRAPHICAL JOURNAL



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# THE CANADIAN GEOGRAPHICAL SOCIETY

OTTAWA, CANADA



The Society's ambition is to make itself a real force in advancing geographical knowledge, and in disseminating information on the geography, resources and people of Canada. In short, its aim is to make Canada better known to Canadians and to the rest of the world.

As one of its major activities in carrying out its purpose, the Society publishes a monthly magazine, the Canadian Geographical Journal, which is devoted to every phase of geography—historical, physical and economic—of Canada, of the British Commonwealth and of the other parts of the world in which Canada has special interest. It is the intention to publish articles in this magazine that will be popular in character, easily read, well illustrated and educational to the young, as well as informative to the adult.

The Canadian Geographical Journal will be sent to each member of the Society in good standing. Membership in the Society is open to any one interested in geographical matters. The annual fee for membership is four dollars (Canadian currency).

The Society has no political or other sectional associations, and is responsible only to its members. All money received is used in producing the Canadian Geographical Journal and in carrying on such other activities for the advancement of geographical knowledge as funds of the Society may permit.

# CANADIAN GEOGRAPHICAL JOURNAL

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*Editor - GORDON M. DALLYN — Assistant Editor - MALVINA BOLUS*

This magazine is dedicated to the interpretation, in authentic and popular form, with extensive illustrations, of geography in its widest sense, first of Canada, then of the rest of the British Commonwealth and other parts of the world in which Canada has special interest.

The articles in this Journal are indexed in the *Canadian Periodical Index* which may be found in any public library.

The British standard of spelling is adopted substantially as used by the Dominion Government and taught in most Canadian schools, the precise authority being the Oxford Dictionary as edited in 1936.

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JULY, 1949 ✦ VOLUME XXXIX ✦ NUMBER 1

COVER SUBJECT: — *Fishing boats putting to sea.*
N.F.B. photograph



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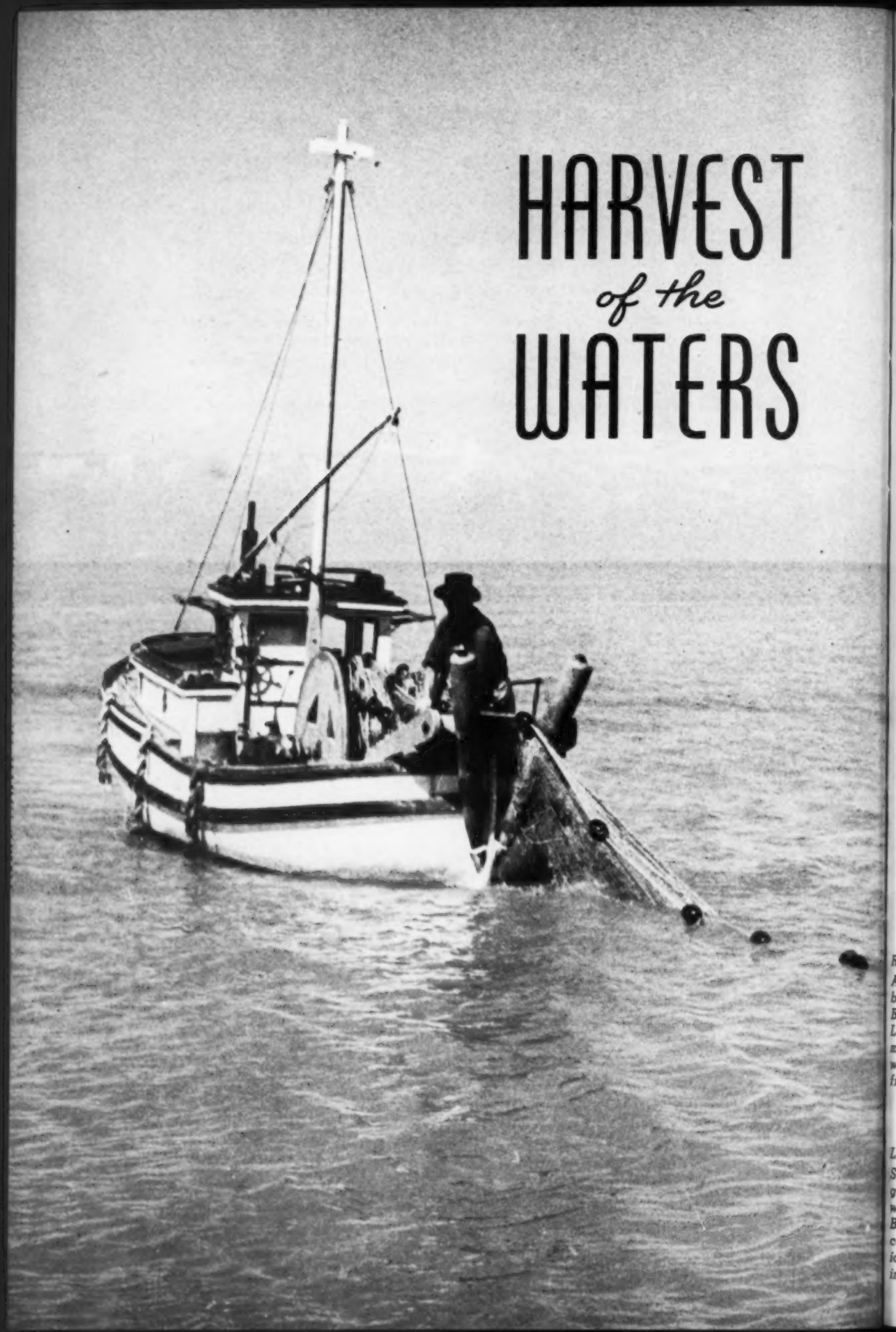


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*by* LORNE MANCHESTER

National Film Board photographs

IT IS THE HOUR BEFORE DAWN. The village nestled in the cove is deep in sleep, the houses shadowed by the hills in the background.

The night is clear, still, and the sky bright with a myriad stars. Only the surf booming on the rocks at the harbour mouth and the occasional lap-lap of the tidal current on the steep shore break the peaceful calm. The air is pungent with the smell of wet seaweed mingling with the odour of fish—not an unpleasant smell but a tangy odour associated with the sea.

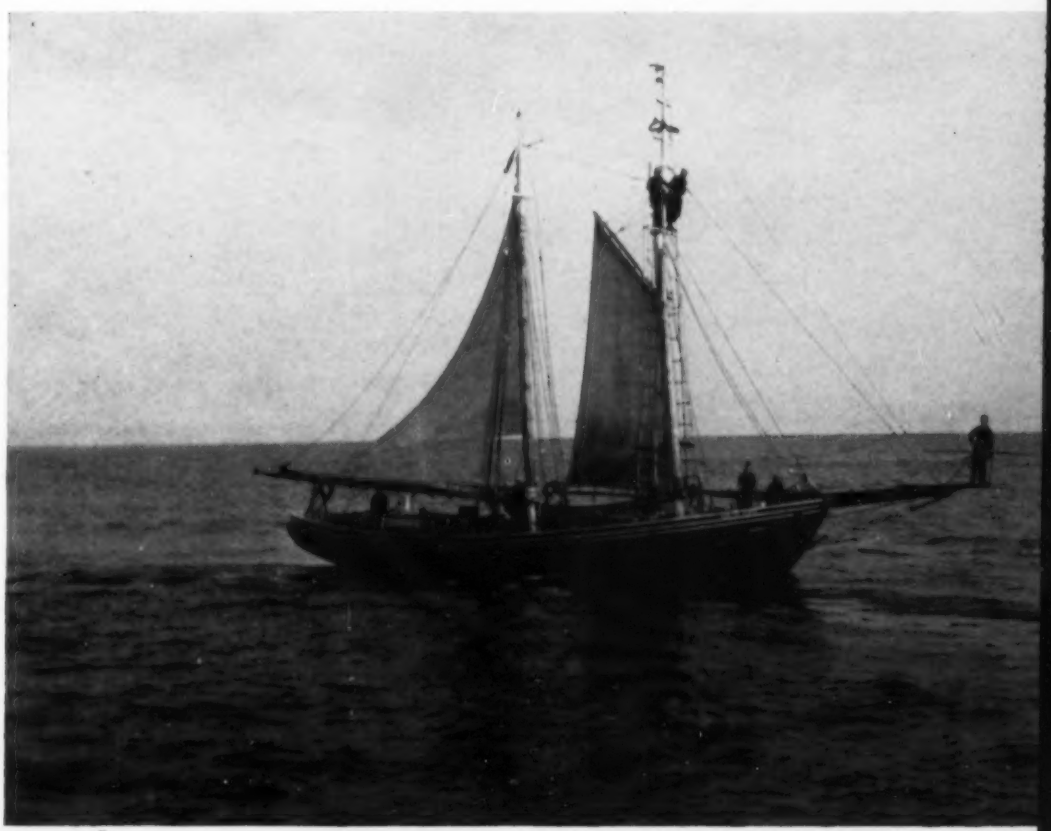
Out in the harbour lie the white-hulled boats of the fishing fleet, their shadowy forms merging with the darkness beyond.

Suddenly a light pierces the gloom. Almost simultaneously lights appear shining through the windows of the homes bordering the water-front. Doors are opened and closed, quietly so as not to disturb the sleepers, and moving figures appear along the shore. The scuffle of feet is heard coming down on a wharf. The menfolk are starting out for the day's fishing.

The sounds become louder. The staccato explosions of a gasoline engine break the subdued undertone of men's voices. The men begin to shout above the roar of the engines. Within a few moments the harbour has lost its serenity and the roaring exhausts awake the echoes, the sounds intensified by the rocky walls of the harbour. The boats lunge out into the channel while the wash from them swishes around the wharf pillars and crashes upon the shore.

It is all over in a few minutes. The sounds fade away, the wash dies down to a ripple and the empty harbour resumes its quiet as the light grows and the fiery glow of the awakened sun reflects on the windows of a fishermen's home up the hill.

So starts the day in the life of Canada's fishing communities which dot our far-flung coast-lines—communities which wrest their livelihood from the sea. Life for the men who reap marine gold is fraught with hazard, whether they are engaged in gill-netting for salmon, trolling for the swift albacore tuna,



*Right:—*
*A sword-fishing boat out of Glace Bay, Nova Scotia. Lookouts on the mast scan the waters for the big fish.*

*Left:—*
*Setting a salmon gill net in Pacific waters off the British Columbia coast from a typical small fishing boat.*

line-fishing for cod and other groundfish or spearing swordfish.

By the very nature of their work, Canada's fishermen have developed into a sturdy race of individuals, inured to cold weather, bitter winds and rough seas and capable of working cheerfully under arduous conditions. They live dangerously and their returns vary. There may be plenty of fish in the sea but it is often difficult to take them out of it and not always profitable to sell them when taken out. A poor season may be followed by a good season and the fisherman must be prepared to gamble on this uncertainty and make the most of his opportunities.

The fisherfolk of Canada's coastal areas helped to write the history of early settler days because the fishing industry is the oldest of any gainful occupation on the part of the European invader of this section of the continent.

There are hazy hints that the prolific fisheries of eastern Canadian waters were being exploited before Columbus made his first voyage in 1492 and that it was from fishermen that he learned of the existence of a westward continent before he ventured forth.

With the exception of whales and the strange creatures which live in abyssal depths, marine life abounds mainly on the "continental shelves" which rim the world's land masses. These shelves comprise about 7.6 per cent of the total sea area. Most of the fish swarming on the shelves live in water 600 feet deep or less. Nautically speaking, that is 100 fathoms. A very few live in waters as deep as 200 fathoms.

Since the best fishing grounds are those found in areas where the depth does not exceed 100 fathoms, countries with shores running steeply into deep water are generally restricted in fish resources. This particularly affects countries south of the Equator where commercial fishing is generally a local industry confined to inshore waters. Much of the fish consumed by these southern populations is supplied by producers north of the line. As a matter of fact, 98 per cent of all commercial fishing is done

*St. John's harbour, Newfoundland. The island had a great cod fishery when Canada was an empty wilderness. Now, as the tenth province, she increases the volume of the Dominion's annual catch by about forty per cent.*

*Above:—*
*A fishing scene off the Gaspe coast. These fishermen are hand-line fishing for cod from small boats near the village of Riviere au Renard. Inset: landing a big cod.*

in the Northern Hemisphere. Here are the salmon, herring, cod, mackerel, halibut, haddock, sardine, lobster and other kinds of fish common to our tables.

Enormous quantities of fish are taken from the shallow North Sea and the water around Great Britain. Similarly the coastal areas of Russia, Norway, Iceland and Japan all possess fishing grounds which extend many miles off shore.

Coming closer to home, the waters around the North American continent are rich with many kinds of fish. Here the land in meeting the sea runs out under water for many miles before the 100-fathom limit is reached, providing a feeding ground for marine life fertilized by great rivers and food-bearing floods.

*A Nova Scotian fisherman whose catch comes from the Bay of Fundy.*

*The day's catch of cod is unloaded at the dock at Glace Bay.*

This gives Canada ready access to fishing grounds which are perhaps the most extensive in the world. On the Atlantic coast are the rich Banks, a submerged series of hills stretching from Cape Cod to the Grand Bank of Newfoundland, a northeastward slope of about 1,000 miles. The area of the Grand Bank alone exceeds that of Ireland by 3,500 square miles. Since the time of Cabot these banks have been internationally famous for their yields of cod. Fishing craft from Great Britain, France, Spain and Portugal have reaped bountiful harvests from the sea on these grounds for centuries and still do.

While the offshore or "bank" fisheries of Canada are carried on from both Pacific and Atlantic ports, the term is more properly applied to the Atlantic fleet engaged in taking cod, haddock, halibut and similar ground-fish. The halibut fishing grounds of the Pacific are extensions of the continental shelf and do not run far out from the land—sixty to seventy miles at most.

Off the Atlantic coast, the Banks stretch 300 miles out from the nearest land. From the farthest east point of Nova Scotia to the middle of the Grand Bank a vessel would sail 450 miles. However, the majority of Canadian offshore fishermen work the Banks nearer home and seldom sail more than 250 miles from port. A sturdy fast-sailing type of schooner was developed by the Nova Scotians for bank fishing. The famed clipper schooner Bluenose was perhaps the best example of this type. Today the ships that go to the Banks are powered with diesels and sail is only auxiliary.

In addition to the deep sea fishermen of Canada who battle fog, snow and bitter weather to reap the ocean's harvest, there are the inshore fishermen who work with

fast motor boats, long lining for cod and flatfish, trapping lobsters, spearing swordfish and netting herring. They may catch fish along almost any mile of a coast-line of more than 5,000 miles running from Grand Manan in New Brunswick northward to Labrador.

The Bay of Fundy, the Gulf of St. Lawrence and other waters contain more than four-fifths of the total area of the fishing grounds of the North Atlantic, or some 200,000 square miles.

Cod and lobster are the greatest sources of revenue for the industry on the east coast. Fishermen from the Gaspe, New Brunswick, Nova Scotia and Prince Edward Island take between 250,000,000 and 300,000,000 pounds of cod which have a marketed value of some $20,000,000 annually.

Atlantic lobsters are famed as a sea delicacy and are flown in "live" state to inland centres to delight the epicure. The fishery has been a lucrative one for the fishermen and as a consequence there was danger of depletion of the stocks from overfishing. Today, conservation measures are enforced by the Department of Fisheries so that natural propagation is not interfered with in too great measure. An interesting sidelight to this phase of the fishery is the report of attempts conducted last year to determine if Atlantic lobsters could live and propagate in Pacific waters. Some 2,000 lobsters from Prince Edward Island were shipped to the west coast and observations made indicated that Atlantic lobsters could live and produce eggs in their new surroundings.

However, results were inconclusive since most of the lobsters disappeared from the lagoon in which they were placed and were never seen again. The Fisheries Research Board of Canada, which is the scientific arm

*Fishermen aboard a deep-sea trawler off Nova Scotia clean and sort their catch which is then packed in ice in the hold.*

*"Seining the weir" for herring at St. Andrews, New Brunswick, in the Bay of Fundy. The seine is a long net with floats at the top and weights at the bottom edge; the weir is a fish trap.*

of the Department of Fisheries, plans to conduct further lobster experiments on the west coast this year.

In addition to the cod and lobster, east coast fishermen help themselves to some 47,000,000 pounds of haddock, as well as many other kinds of fish such as alewives or gaspereau, hake, halibut, herring, mackerel, pollock, sardines, salmon, smelt and swordfish, and shellfish such as oysters, scallops and clams.

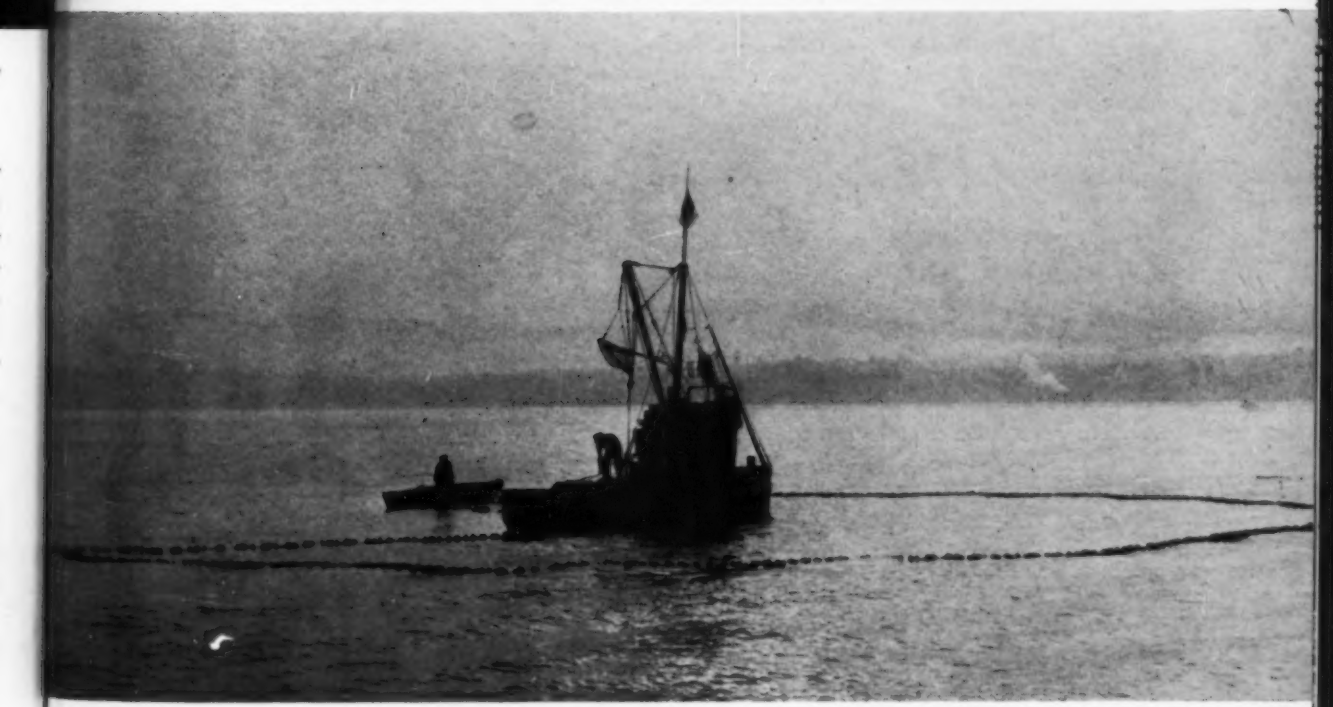
On the western side of the continent, British Columbia's coast-line of some 7,000 miles borders waters rich in salmon, halibut, herring and many other fish.

The rich "take" from the salmon resources of the province, however, has been the main reason why British Columbia leads the other provinces of the Dominion in annual marketed value of fisheries production. The salmon fishery is an inshore operation, the sleek beautiful fish being taken by the hundreds of thousands in gill nets, trolls and purse-seines around the mouths of the coastal rivers as they swarm in from the sea to ascend the rivers to spawn. Practically all of Canada's big production of canned salmon is obtained from the west coast.

Something like 200,000,000 pounds of salmon may be caught in a single season and the production runs to about $25,000,000 annually. The canned product — known throughout the world—accounts for about $18,000,000 of this figure.

*Glace Bay, Nova Scotia, harbours a fleet of sword-fishing and cod-fishing boats.*

*Salmon fishermen prepare to "purse up" their seine on the British Columbia coast.*



*On the British Columbia coast salmon fishermen transfer their catch from the seine net to the hold of their boat with a brailer.*

As in the case of the lobster, a lucrative fishery results in such an intensive effort on the part of the fishermen that there is danger of depletion of the fish stocks to a point where natural propagation is insufficient for survival of the species. In view of the importance of the salmon in British Columbia's economy, regulations respecting fishing seasons, size of nets and fishing boundaries are enforced by federal fisheries officers to allow salmon to escape to the spawning grounds in sufficient numbers to maintain natural reproduction. The Department of Fisheries also conducts a program of stream clearance and improvement to increase the chances of survival of salmon eggs and fry.

During the war the bulk of canned salmon was made available to help meet food needs of the United Kingdom and peak production was reached when some 2,250,000 cases were put up in one year. The normal pack ranges anywhere from 1,250,000 to 1,750,000 cases.

In the comparatively shallow waters around Queen Charlotte Islands and areas between these islands and the mainland, halibut and other fish are in abundance. In the north Pacific, the halibut fishermen land much the greater part of Canada's halibut catch. They share this fishery with the United States under international agreement and a quota is set each year to prevent depletion of the grounds. Last year, some 18,000,000 pounds of halibut were caught by British Columbia fishermen.

The rich northern Pacific fishing grounds also yield black cod, grey cod, red cod, ling

cod and grayfish. More to the south in the waters around Vancouver Island enormous quantities of herring are scooped out of the water in huge purse-like nets. The fish meal and oil industry which runs into several million dollars a year is largely based on the herring fishery which yields some 250,000,000 pounds annually.

Before World War II only a small portion of the herring catch was marketed as canned food. The main portion of the catch was utilized by fishermen as bait and as raw material for the plants turning out fish meal and oil. Canning of herring jumped to unprecedented levels as the food needs of countries at war increased. These large shipments of herring to the United Kingdom and later to UNRRA relief needs continued until 1947.

The first settlers commercially exploited the freshwater fisheries of Quebec and Ontario and early records give accounts of the number and extraordinary variety of fish in the rivers and lakes of these provinces. Some species, once common, like salmon and shad have disappeared from Ontario waters and the numbers of sturgeon have been reduced to but a fraction of what they formerly were. The most valuable product of the freshwater is the whitefish which ranks in the upper brackets among the leading contributors to Canada's fishery wealth. Approximately one third of the annual marketed value of the inland catch is accounted for by this excellently flavoured food-fish.

It is interesting to note that Canadian lakes contain more than half the freshwater of the globe. The industry is of importance in Ontario, Manitoba, Quebec, Alberta and Saskatchewan and the marketed value of the annual catch which now runs to some $15,000,000 makes a worthwhile contribution to the Dominion's fisheries as a whole. The more important commercial species caught are lake trout, pickerel, whitefish, blue pickerel, tullibee, saugers and pike. About half the production comes from the Great Lakes of Ontario, one quarter from those of Manitoba and the balance from the other provinces.

### Economic and Regional Aspects

Compared to some other industries, the annual over-all production value of the fishing industry—about $145,000,000 in 1948 (excluding Newfoundland)—is not high. But

*Freshwater fishing in Manitoba yields a greater catch in winter than in summer. Here fishermen draw in the nets that have been set beneath the frozen surface of Lake Winnipeg. The day's catch will be loaded into the horse-drawn caboose in the background.*

*Salmon fishing boats lie at anchor in a harbour near Vancouver, British Columbia.*

to the Maritime Provinces and to British Columbia the fishing industry is of vital economic importance. In the provinces of Quebec, New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland on the Atlantic seaboard and in British Columbia on the Pacific, thousands of Canadians depend on the fisheries for a livelihood and are engaged directly in fishing operations or in shore work associated with them.

The war and the post-war years with their great demands for protein foods have been years of increased prosperity in the fishing industry. The figure of $145,000,000 for the marketed value represents an increase of $85,000,000 over 1939.

With the inclusion of Newfoundland, the status of the industry in Canada's economic structure has altered. Newfoundland's fishing industry holds a key position in that province's economy and at least one-half of the population are directly dependent upon it for a livelihood. Reckoned on the basis of recent price levels, the total production (including Newfoundland) from the fisheries will represent $180,000,000 or more annually.

Canada's fisheries are in three widely separated areas. The industry faces certain problems particular to each area which must be overcome if it is to prosper to the extent of its potential resources.

These problems are in part due to regional differences in the development of catching, handling and processing methods, differences in species of fish available, differences in the form of product offered to consumers and differences in distribution facilities.

On the east coast the extent of the coastline, the regional appearances of fish populations and the existence of both an offshore and an inshore fishery make the problem a complex one about which it is difficult to generalize.

Lack of capital has hindered the development of the fishery, especially on the offshore grounds. Canada has a great natural advantage over her competitors in the prosecution of this fishery and could expand her share of the catch with a larger offshore fishing fleet. Increased catches, taken in the most efficient and economical manner, could be disposed of on the United States market which is at present Canada's best customer.

As far as the inshore fishery goes, the industrial units are on a small scale, partly attributable to the many kinds of fish taken on the Atlantic coast and to the fact that they are landed all along the coast-line which was settled in small communities when Canada was young.

On the Pacific Coast, the industry is highly capitalized with big firms, modern plants and mechanized fishing equipment, but it has been mostly an inshore operation. In fact, the salmon and herring are fished so intensively and efficiently that any expansion in the industry depends on further development of other fisheries farther off the coast.

Last year, British Columbia fishermen "struck it rich" when the federal department's protection vessels found great schools of the stream-lined albacore tuna in the lucrative waters off the Queen Charlotte Islands. Whether it was a freak year or whether tuna are there to stay remains to be seen. The whaling industry, another offshore operation, was revived in 1948 with promising results.

One of the great difficulties the industry has had to face is that of distributing the fresh product over the great distances to inland markets. Unlike other food products, fish is extremely perishable, requiring temperatures of around zero degrees Fahrenheit for storage on long-distance hauls.

Largely because of these factors, the fishing industry has had its ups and downs through the years and it remained for the

*A net full of herring on the British Columbia coast. A power winch operates the brailer or huge scoop net which is used to transfer the fish, two tons at a time, into the hold of the boat.*

exigencies of war to bring prosperity. The government, through the Department of Fisheries is co-operating with the industry in attempting to ensure more stable conditions. For instance it is improving its inspection methods to guarantee the housewife higher quality and tastier food for her table.

Improved refrigeration units in railway freight cars are at the present time a project of the Fisheries Research Board. A mechanically refrigerated car, attaining the low temperatures necessary for shipments of fresh and frozen fish over long distances, has already been designed and has completed successful test runs from Vancouver to Edmonton, and from Kelowna, B.C. to Montreal.

Much progress has been made in methods of catching, processing and distribution compared to those of a quarter of a century ago. Sail has practically disappeared from fishing vessels and the diesel or gasoline engine is universally employed; labour-saving devices have been introduced. In many of the larger craft, electrical apparatus is now commonplace—radio direction finders, ship-to-shore telephones, echo depth sounders for locating schools of fish, radios, automatic steerers in some craft, and electric lighting.

With the development of the fresh and frozen fillet business, quick freezers are coming into more general use. Artificial dryers are in wide-spread use in areas on the east coast for the processing of cod. Canneries in certain areas have been modernized and fish meal and oil plants are operating by scientific methods.

Annual fish consumption in Canada has increased slightly in the past couple of years and stands now at between eleven and twelve pounds per capita in edible weight. This figure is low compared to other countries such as the United Kingdom and Norway where the problem of long hauls over great distances to inland markets does not exist.

Although any increase in the amount of fish eaten by Canadians is encouraging to the fishing industry, it does not greatly assist in solving the marketing problems since Canada's fisheries are being further expanded and the efficiency of the industry's production machinery is being improved.

Canadian fishermen land something like 1,200,000,000 pounds of fish every year. Some 300,000,000 pounds go into the fish meal and oil industry. Obviously the remainder is much more than the consumer needs of a nation of thirteen million people. A large portion of the annual output must find outlets in external markets.

### Biological Aspects

Since he does not have to sow what he reaps, the harvester of the sea has an advantage over the harvester of land crops. But this is perhaps the only advantage the fisherman has over the farmer.

The farmer has his crops and his livestock under his eye at all times. Again he has the advantage gained by scientists who have been able to make detailed studies of the flora and fauna of the land.

The fisherman reaps a harvest about which very little was known until a few years ago. Fisheries scientists have been studying the life history of Canada's fishes for half a century but the very nature of the fish's existence poses many baffling problems. Through patient and painstaking efforts, Canada's scientists have been able to probe into the private lives of many species of our fish which rove the marine depths and swarm in our lakes and rivers but there is still much to be learnt. The Fisheries Research Board of Canada is attempting to eliminate some of the guesswork from the fishing industry.

One of the problems is how to effect reasonable stability in the volume of production from season to season. The elusive pilchard is a case in point. The shoals of this pint-sized Pacific coast fish, upon which a big meal and oil business was built in British Columbia, disappeared in 1946 just as suddenly as they had first made their entry into that province's waters two decades ago. This feast-or-famine cycle is a

*Pacific salmon caught in a seine net on the British Columbia coast.*

difficult basis on which to build a permanent industry.

The sudden appearance of albacore tuna in the waters off the Queen Charlotte Islands in the Pacific is another example of the unpredictability of fish. If a British Columbian had gone fishing for albacore a decade ago he would have been regarded as mad and probably would have returned to port empty-handed. Yet tuna caught off the British Columbia coast last year was valued at close to a million dollars.

The Pacific salmon in their early stages of life leave the streams where they were born and dart out to sea, never to be seen again until they return to the same stream at maturity. Where they go and what they eat when they leave their freshwater homes are questions which have not definitely been answered. The problem of unpredictability in the case of the salmon does not arise since they dutifully perform their spawning run at maturity without fail, but the problem of fluctuations in the size of the runs has engaged scientists in long hours of exhaustive study.

Detailed knowledge of the habits of any species of fish is a prime requisite if adequate conservation measures and efficient fishing methods are to be adopted to obtain an annual steady yield with economy of effort.

The lobster industry on the east coast is an excellent example of what can be done to reduce the element of risk. In the days of

unregulated competition for the catch, the sole idea was to take as many lobsters as possible during the season. Possibility of exhausting the supply was not considered by the fishermen until evidence indicated that such a thing was happening.

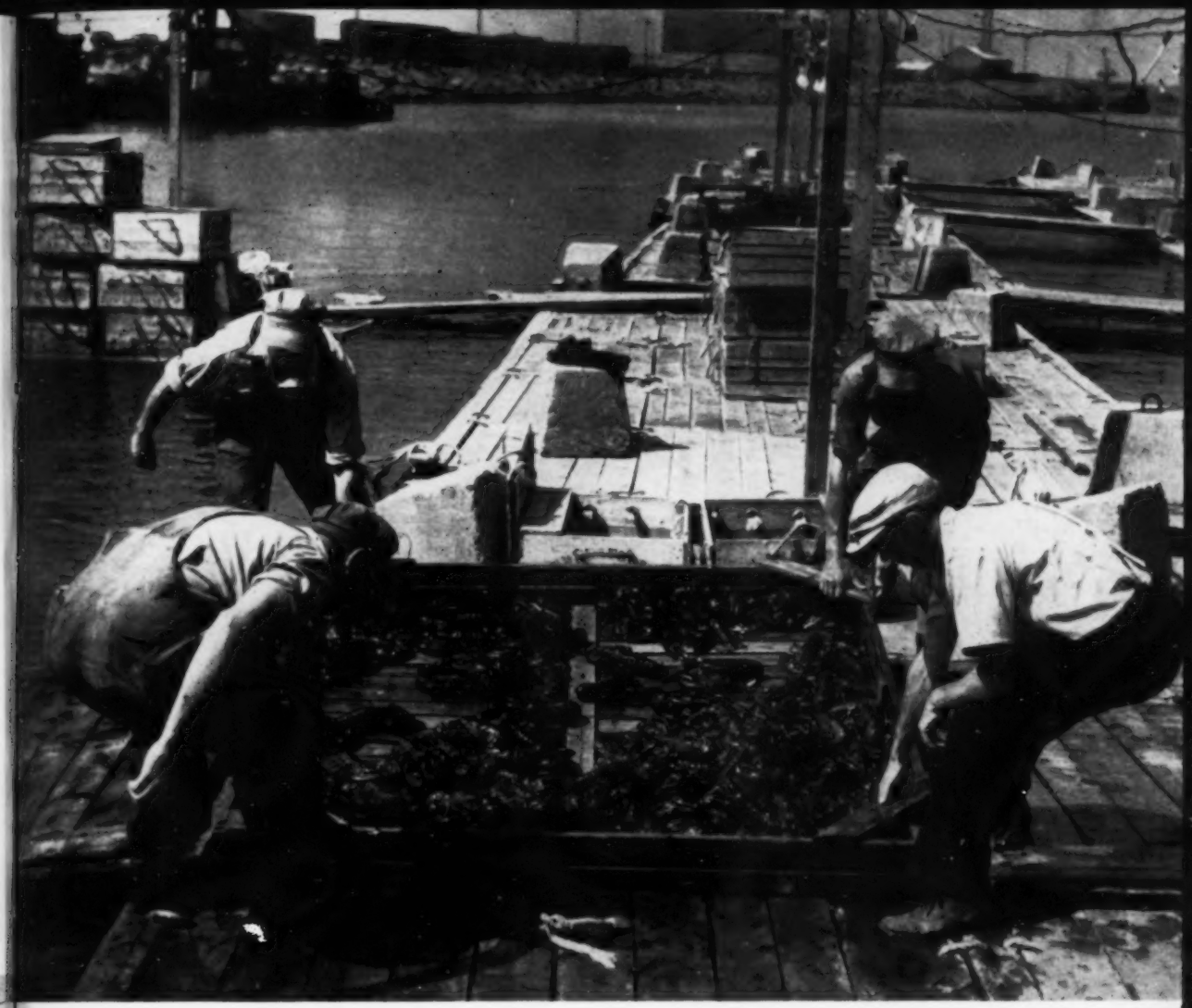
Canadian scientists stepped in to make an exhaustive study of the lobster and these studies formed the basis of conservation measures enforced in an attempt to ensure sufficient reproduction for a continuing yield. The same type of action was taken on an international scale on the west coast for the salmon and halibut fisheries. Two international bodies operate to conserve these Pacific fisheries to the joint advantage of Canada and the United States. These are the International Fisheries Commission which regulates the halibut fishery and the International Pacific Salmon Fisheries Commission which is concerned with the Fraser River sockeye salmon fishery.

The Fraser sockeye commission conducted intensive biological and engineering research to investigate the decrease of the great salmon runs up that river. This research resulted in the construction of the great fishways at Hell's Gate to overcome an obstructive condition which had reduced the sockeye run thirty-five years ago and ever since had prevented its restoration. The Commission has undertaken other minor projects to aid the salmon on their way to the spawning beds with the result that the parent salmon are getting to the spawning grounds in increasing numbers and in better condition.

What has been done for the halibut, the salmon and the lobster will doubtless be done, if possible, for any other fish which enters the economy of the industry.

The east coast herring which spawn near the shores in great schools every spring are at present under the alert eye of the scientist who is trying to discover where they go in

*The salt cod-fish industry is the mainstay of Newfoundland's economy. This fisherman is spreading split cod on flakes to dry in the sun.*



*These men on Prince Edward Island are culling lobsters preparatory to shipping them to a cannery or to the "live" market.*

the summer. The possibilities of commercial fishing in Canada's eastern Arctic are being investigated by the Fisheries Research Board. It was only in 1945 that the Board's scientists investigated areas in the Northwest Territories and came back with information which led to the opening of a substantial commercial fishery at Great Slave Lake, fifth largest lake on the continent.

Through its technological stations on both coasts and inland, the Board gives guidance and assistance to industry. On the east coast, for instance, the Board evolved an improved fish dryer and an improved fish smoker which are now in wide use. On the west coast, the vitamin oil industry owes a great deal to exploratory work by the Board's technical men.

The problems of conservation and development, improvement of quality and increased efficiency in getting the fish from the waters to the dinner tables are being tackled continually by the joint action of federal and provincial agencies and private enterprise. Top-notch quality in the finished product, of course, is the ultimate goal, for it will be only by reputation of high quality of her fish foods that Canada's fishing industry will prosper.

# British Honduras

*by* E. O. HOPPÉ

Photographs by the author

ON THE western shores of the Caribbean amongst the Central American republics lies a narrow strip of land, 170 miles long and less than 70 miles wide, its total area a little smaller than that of New Hampshire. This is British Honduras, bordered on the north and northwest by the Mexican province of Quintana Roo, formerly Yucatan, and on the south and west by Guatemala.

Natural boundaries of the Colony are her rivers Hondo and Sarstoon in the north and south and the Caribbean Sea on the east; her western boundary is a straight line running north from the Gracias à Dios rapids of Sarstoon River to the Mexican frontier.

All along the coast the land is low and swampy, some of it actually below sea-level. It gradually gives way to semi-savannah and scrubland often covered with dense jungle and coarse grassland with patches of dwarfed and stunted oak, pines and palmettos, not unlike the big game country in Kenya and Tanganyika. This pine ridge, as it is called, rises towards the interior to a maximum altitude of 3,000 feet in the Cockscomb range of the Maya Mountains.

Numerous rivers take their rise in this central range and traverse the country in an eastward flow towards the coast. As most of these are navigable they form the natural waterways into the interior; roads are few, and at times impassable.

In the past the Colony has had the reputation of being unhealthy, but this is quite undeserved. It is true that the climate is semi-tropical and, therefore, during the wet season occasionally oppressive but the winter months are ideal, bright and sunny, always tempered by northern winds.

I liked Belize the moment I saw it in the early morning light, from the deck of the



*At top:—A group of Caribs surround the fisherman as he sells his catch.*

little coastal steamer which had brought me there from the Cayman Islands. It is a most friendly and pleasant place and its situation at the mouth of the Haulover Creek—the name given to one of the delta branches of the Belize, or Old River—is very attractive. My first happy impression ripened into a real attachment the longer I stayed in this little town with its warm-hearted people. The curve of the bay is studded with white-walled, red-roofed and deep-verandahed houses standing in luxuriant gardens which invite you to laze and dream. It is, indeed, a place to spend some happy months in—and those in search of winter sunshine would doubtless have discovered, and probably have obliterated, its old-world charm long since, were it not for two disadvantages which the town has to contend with, and which are, indeed a serious problem.

As Belize has been built on flat, low-lying land, only one foot above sea-level and since it is practically shut in by mangrove swamps, the problem of adequate drainage is of course formidable. The present system of sewage disposal is definitely not satisfactory although every effort is being made to make it so.

The other difficulty is the supply of fresh water. The town entirely depends for its drinking water on rainfall which is collected in large municipal tanks, supplemented by private vats which each dwelling is obliged by law to maintain.

Rough seas along the coast are rare as a triple line of coral reefs stretches parallel to the mainland in an almost continuous chain from the arid tongue of the Yucatan peninsula to the southern border of the


Canadian Geographical Journal map

*A string of atolls parallels the coast. Sergeant's Cay, shown here, is just large enough for two houses.*

*Market Place in Belize, capital of British Honduras.*

Colony. It forms a perfect line of natural protection. Separated by these lanes and channels are cays and atolls of all sizes and several of them are used as week-end and summer resorts.

Low and flat, they seem to float on a peacock-blue sea, their languorous bays laced with palm trees which rise from the fringe of golden sands, sheltering lagoons of sensuous beauty. Here and there the palms brush lightly with the giant dusters of their plumes scarlet roof-tops which are half hidden in greenery. Pools of jasper and aquamarine reveal in crystal clearness delicate schemes of coral loveliness, where shoals of tiny fish of rainbow hues lie motionless in an enchanted sea-garden or dart and flash through its weedy thickets.

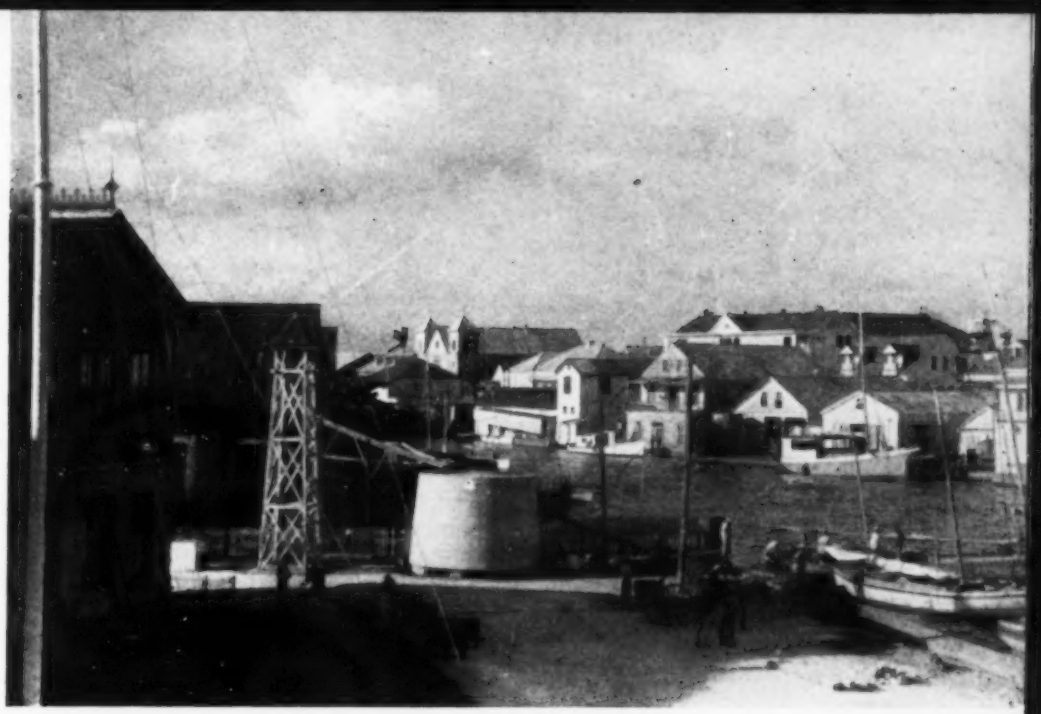
Between the cays and the mainland lies a stretch of calm, shallow water which varies in breadth from five to twenty miles —an ideal sailing course when the trade winds blow.

### The People

The entire population of the Colony is in the neighbourhood of 63,000, composed of a most heterogeneous mixture of peoples and welding of races.

There are the descendants of the ancient Mayan Indians, Spanish and Indian Mestizos, Mexicans, Guatemaltecans, Caribs, Syrians and Chinese, East Indians and refu-

*Street in Belize. The large tank is for storage of rainwater, the only drinking water available. It is compulsory for every private house to have a rainwater tank.*



*A branch of Haulover Creek which divides Belize.*

gees from various parts of Europe. The small white population is largely of Scottish extraction with some descendants of Americans from the Southern States who settled in the Toledo district after the American Civil War and who form a colony of their own. Almost one-half of all these people live in the capital. As is to be expected there is a blending of many languages—English, Spanish, Maya, Carib and Creole. Incidentally, it should be explained that the term Creole, used in British Honduras, denotes people of African ancestry born in the Colony whereas in Jamaica and in other West Indian islands it is applied to all persons born on the islands of non-aboriginal stock.

The Maya Indians are the indigenous people of the Yucatan peninsula, southern Mexico and northern Guatemala. They live in open villages or on government reserves, mainly in the south and the southwest of the Colony, under the jurisdiction of an alcalde, or headman, with the powers of a petty magistrate. With the exception of their traditional dances which they perform to the accompaniment of the marimba, that rich-toned African musical instrument which is often heard in various parts of the Congo and on which several men play simultaneously, there are no evidences of the former high culture of their forefathers. The men are short, muscular and healthy-looking but the rate of mortality is high and threatens to wipe out the people. Honest in character, intellectually alert, reliable, neat and clean in person the Indians carry on a rather primitive agriculture and raise a few pigs which constitute their wealth. Their family life is exemplary and they are a most cheerful people.

*A Carib settlement at Seine Bight in the Stann Creek district, south of Belize.*

*An Indian woman, said to be 90 years old, at Corozal.*

forests are Caribs. They possess a sea-going genius, are admirable sailors and navigators who will go anywhere in their small canoes, and their proficiency with seine, cast, line or spear makes them born fishermen.

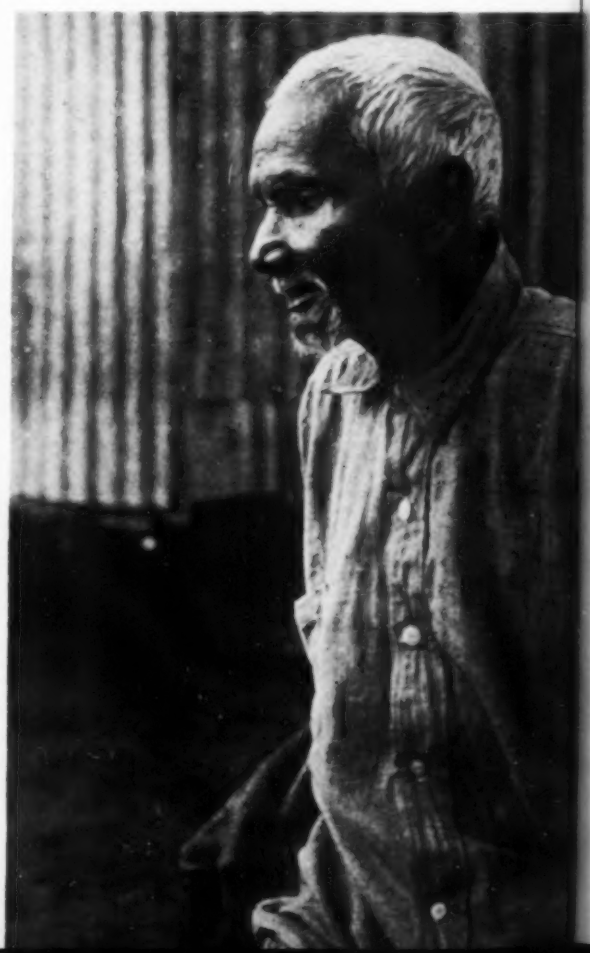
### Historical Background

There is some speculation as to whether Columbus discovered the coast about 1502 but there is little doubt that Hernando Cortez on his overland expedition from Mexico twenty years later passed through part of what is now British Honduras. However, it almost certainly was a favourite rendezvous of pirates of many nationalities who terrorized the Caribbean during the seventeenth century and who were attracted to the shores by the safe shelter and hide-outs which the numerous islands, known as *cays*, afforded.

British ties with the territory go back to the year 1638 when the first settlement was recorded of a handful of shipwrecked adventurers under the leadership of one Wallis, or Willis, a Scotsman, who took up abode on the mainland. It has been suggested that he

Quite often the villages stretch along both sides of a primitive road for half a mile, or more, the little mud-bedaubed wattle homes wearing brave coats of pale pinks and yellows, and looking friendly under their palm thatch against the sombre backcloth of forest greenery.

The Caribs, who live mainly in the south of the Colony, are a very distinct type, of mixed African and Carib origin with a certain admixture of Spanish blood. Although they were once truculent and fierce they have long lost their taste for fighting and have become shy and reserved. They are a fine race of men and women of high intelligence who have maintained their separate identity, seldom mixing with negroes and speaking a language of their own amongst themselves, an African dialect with an admixture of French, Spanish and English words. The very powerful physique of the men helps to make them very excellent woodmen and most of the timber workers in the



*An old man of East Indian descent.*

*Forest ranger's cottage under construction at Stann Creek.*

left his name to the principal town, the Spaniards who were then in possession of the country calling him Vallis and that in time being corrupted to Belize which is the present capital of the Colony. Others maintain that Belize derives its name from the French balise or beacon, which is supposed to have stood at the entrance to the river on which the settlement lay.

The settlers were soon joined by others from Jamaica who were attracted by the abundance of logwood which was found growing on the banks of many rivers.

The woodcutters, or "baymen" as they were called, had their headquarters on St. George's Cay, an island a few miles east of Belize, and the territory became known as the "Settlement in the Bay of Honduras", a title which it retained until 1862 when it became a colony. There is no doubt that in the early days the sphere of the woodcutters extended much farther south than the present boundary line on the Sarstoon River.

At this time the whole of Latin America, with the exception only of Brazil, was ruled by Spain, and from the earliest days the presence of the settlers was hotly contested by the Spaniards. Frequent attempts were made to expel them and many conflicts ensued. The feud went on for nearly a century and a half with alternating success.

Compared with the neighbouring states of Guatemala and Mexico, British Honduras is not rich in remains of ancient Maya culture which is supposed to have reached its zenith about A.D. 500.

However, several sites are known to exist and ruins of temples, domestic buildings and

*A young Maya Indian woman with her child.*

*A settlement on the Northern River at Maskalls.*

playgrounds were excavated just before the last war and further explorations are planned to take place as soon as the necessary funds become available. The two most important discoveries yet made are those of the large ancient city of Lubaantum on the Rio Grande and of the hill temple of Xunantunich in the jungle near Benque Viejo, west of El Cayo. It is unfortunate that these places are located in dense tropical jungle and therefore difficult of access.

I was lucky in being able to visit Xunan-

*Spearing fish off Placencia Island in the Gulf of Honduras.*

tunich—which literally means "Virgin of the Rock"—in the company of Mr. Lamb, the conservator in charge of the Colony's forests, and Mr. Anderson, the District Commissioner of the Cayo District who is a very keen amateur archaeologist.

We found the remains of a massively built two-storey temple with fortress-like walls crowning the top of a steep pyramid-shaped mound in which—so my companion told me—an older building is known to be buried. At the foot of the mound were some upright sculptures, stelae carved deep with mythological characters, probably representing calendrical Maya dates. They stand as monuments to the pre-Columbian culture of a people who once were masters of the land.

### Administration

The early settlers managed their affairs for many years with assistance of a magistrate who was elected annually by popular vote. This magistrate was later succeeded by a superintendent appointed by the British Government and in 1870 British Honduras became a Crown Colony.

The present constitution comprises the Governor and Commander-in-Chief, who is assisted by two Councils of advisers, the Legislative and the Executive Councils. The former consists of five officials and seven unofficial members, nominated by the Governor, and the latter of the Colonial Secretary, the Attorney General and the Senior Medical Officer who serve ex officio, with another two or three members nominated by the Governor who, himself, presides.

For administrative purposes the Colony is divided into five districts—the Belize, the Northern, the Cayo, the Toledo and the Stann Creek districts—each with a Commissioner who represents the Governor and exercises the judicial functions prescribed by law.

British Honduras has her own currency in dollars and cents, equivalent to the United States dollar.

The revenue of the Colony is derived from customs duties and taxes, from rents from Crown Lands and from royalties to cut timber and bleed chicle. Exports are almost ex-

*Splitting cohune palm leaves for thatching.*

*A Carib fisherman in the Stann Creek district.*

clusively confined to raw materials, mainly the produce of the forests, and more than half are shipped to the United States. In 1940 the proportion of exports from the Colony to the United Kingdom was under thirty-four per cent, that to the United States fifty-five per cent.

### Communications

For many years the numerous rivers of the Colony have provided the principal means of communication, and transport was almost entirely dependent on the waterways. Even today much of it takes place by shallow riverboats and dug-out craft which ply many of the seventeen principal rivers.

Soon after the upper reaches of the rivers have been passed the jungle surges close to the water's edge in lavish abundance. It forms arched walls of liana-draped, umbrageous figs, fine-leaved prickly bamboo and grotesquely stunted trees, almost for the whole course of these rivers, often leaving as roof only a narrow strip of green-filtered sky.

Great strides have been made in road construction within recent years, but the Colony has still far too few serviceable roads, and no railway at all. Only two roads lead out of Belize, the partly-finished road west into the interior, via El Cayo, towards the Guatemalan frontier, and another to Corozal and the Mexican Border. Both roads had to be built across extensive mangrove swamps which lie as a barrier between the capital and the hinterland—a costly bit of road engineering, but very efficiently carried out by the government.

The completion of the El Cayo road will mean the saving of forty miles over the

*At top:—A young girl guide belonging to the Methodist Church troop at Stann Creek.*

*Archbishop Dunne talking to the nurse in front of the dispensary.*

*El Cayo, viewed from the Rest house. This town is on the Belize River, near the Guatemalan frontier.*

river journey which used to be the only means of reaching the town. All traffic had to go up the Old River in shallow motor boats which towed strings of pitpans and which took from three to ten days, according to the depth of the water. This lack of roads has been due to two main causes: chronic scarcity of available funds, and the exceptional difficulties of the terrain. Practically the whole length of the low-lying land is, in many places, not more than one foot above sea-level and, while some areas are passable in the dry season, they become inundated during the wet weather. To this must be added the fact that for more than two centuries there has not been any need for the "baymen" (as the settlers became known) to take the trouble of building roads as the logwood and the mahogany which they cut and exported grew in abundance along the coastal belt and close to the rivers.

The Colony is at present engaged in an ambitious road-building program, as part of

*The all-weather motor road which replaced the country's only railway in the Stann Creek Valley.*

*Typical "pine ridge" country which lies between the low coastal lands and the mountains.*

its forestry project, which should do much to open up the fertile country districts of the interior and set it on the road to prosperity.

### Resources

No other colony in the Commonwealth is so rich in forests as British Honduras. About ninety per cent of the total area is covered with dense tropical forests, and their excellent timber provides the country's main source of revenue.

British Honduras mahogany is valued for its fine quality and beauty and its export has been the Colony's most important industry for over a century. The bulk of it does not come to the United Kingdom, as one might expect, but is, and has been for many years, absorbed by the United States.

Mahogany trees are rarely found in groups but are widely scattered throughout the forests and the timber-exporting companies employ "hunters" or "timber-cruisers", namely expert woodmen, to search for suitable trees to be selected for cutting. When a tree has been felled the trunk is lopped, cleaned of branches and cut into logs which are then trucked by oxen yoked in teams of ten or more to the "barquedier", which is a cleared space beside a river or a creek. Until recently this operation took place at

*Pasture in the Toledo district with limestone hills in the background.*

*Snake cactus on a tobroos tree.*

night by torch-light as during the day the oppressive heat in the closed-in forest was such that the animals would soon have become exhausted. Now, however, diesel-engined crawler-tractors have replaced oxen in all the larger camps. The logging must be completed by the beginning of the rainy season, which is in May or June, when the rivers will carry sufficient water to float or "drive" the logs down to the mouth. There the "boom-men" assemble them into rafts, a tricky and highly skilful job.

The income of the Government in the shape of royalties on concessions is very considerable and forms by far the greater part of its revenue. The concessionaires pay the Government a royalty of about seven dollars per tree on the timber they cut and six cents per pound on chicle, the forest product second only in importance to mahogany. In 1944 these royalties amounted to $50,000. To this one must add the export duties of $2 per 100 cubic feet on

*Right:—Male flower and young fruit of the Cohune palm.*

*Below:—Pine seedling station at Stann Creek.*

*Orchids growing on trees in a mahogany forest. The man in the right foreground gives an indication of the size.*

mahogany and one cent per pound on chicle.

For more than two centuries there has been a continuous dissipation of the Colony's timber stock. The early settlers found mahogany, cedar and logwood close at hand and they cut in a very wasteful manner without thought for the future. But forests take many generations to grow and after woodcutting operations, which have lasted well over two hundred years, it is only natural that most, if not all, of the timber which grew within easy reach of the rivers should have been cut down. No efforts have been made in the past at reforestation and the forests have consequently suffered through constant exploitation.

A very vigorous policy of regeneration of forest crops is now exercised. Strict enforcement of protective legislation prevents further forest destruction by private owners or contractors and acts as safeguard against future damage.

The original source of wealth of British Honduras—the line which held the early colonists against hardship and struggles for possession—was logwood. The export of this wood was highly profitable. It was used in Europe in large quantities, the dye-stuff that it yields being much in demand. Owing to the growing use of synthetic dyes, however, its export is now reduced to a very low level.

Another valuable forest and jungle product is the Cohune nut palm (*Orbignya Cohune*), one of the noblest members of the palm family. The growth of this fine tree

*Left:—Logs of mahogany, marked and ready for their journey to the mills.*

*Rafts of mahogany at the*

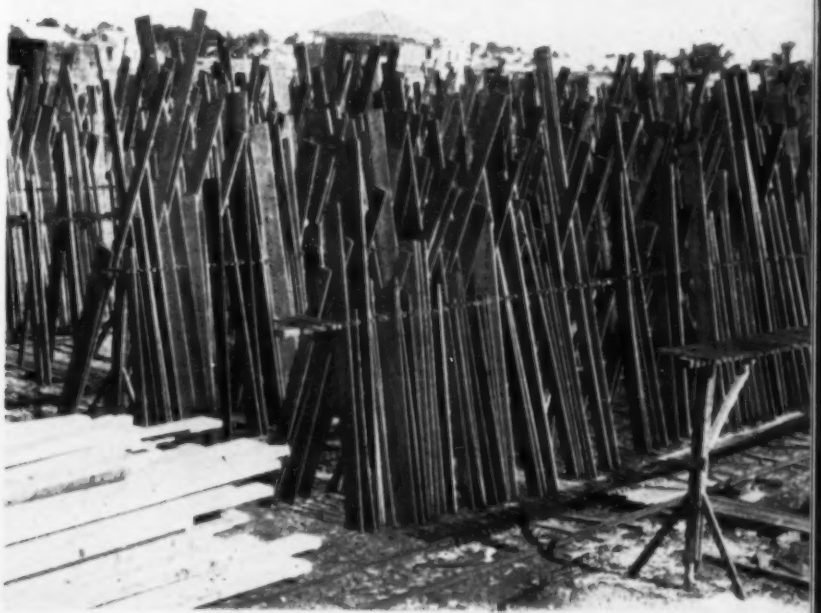
*A Yucatan Indian and a Carib at Hondo River which forms the frontier between Mexico and British Honduras.*

is prolific and in some parts of the country it forms twenty to thirty per cent of the vegetation, the remainder being composed either of mahogany, cedar, rosewood, sapodilla, or Santa-Maria. Its nuts, which grow in large bunches, furnish a valuable oil and vegetable ivory. Owing to the technical difficulty of cracking the exceedingly hard shells, previous attempts to market the nuts extensively have failed, but with the installation of portable nut-cracking machines a development of the industry may be expected.

Next to timber, chicle, which forms the base for chewing-gum, is the Colony's most valuable natural resource. Chicle is the gum or latex of the indigenous sapodilla tree which grows scattered over extensive forest areas and which the Indians have been in the habit of using as a stimulant. Chicle provides the essential ingredients of the commercial chewing-gum and all of it goes

*Right:—Timber stacked ready for shipment at the Belize sawmills.*

*at the Haulover Creek in Belize.*



*Collecting grapefruit from the citrus grove.*

to the United States. In 1940 the value of exported chicle amounted to more than forty thousand dollars.

British Honduras has enough fertile land to provide all her own needs, but she cannot do this unless suitable land is opened up and made accessible. This involves the construction of roads, followed by a consistent encouragement of land settlement. At present agriculture is negligible with the exception of some parts of the north and in the Toledo district, and only about two per cent of the country is under cultivation.

The method of raising corn today is of the crudest description. It is known as "milpa" cultivation (of the same nature as one finds in many parts of Africa) and consists of roughly clearing and burning off small areas of scrub or forestland, planting and harvesting one or two crops and then abandoning the plantation for a fresh one —a most extravagant and wasteful method. The Government has recently settled eighty refugee familes from Europe on fertile stretches of land where sugar-cane, coconut and citrus fruit are being cultivated.

Honduranian grape-fruit is of very high quality and the fruit which is grown in the Stann Creek Valley has, in fact, carried off more gold medals at international exhibitions than any grown elsewhere. It appears that the soil of this district is peculiarly suited to the cultivation of citrus fruits and miles upon miles of orange, lime and grapefruit groves line the valley on both sides of the road which was once the track of a railway—the only one the Colony has ever possessed. The railway was built before the Panama Disease killed the banana trade. It ran from the coastal town of Stann Creek through magnificent scenery up to the end of the valley for the purpose of banana transportation but became useless when the trade failed. The district is now the centre of the Colony's valuable citrus industry with fresh fruit packing and canning factories.

So far British Honduras has not attracted many visitors as the travelling facilities are poor—but it is a wonderful country for those who wish to spend some months of unconventional travel in a rather primitive way and explore on horseback its vast network of trails through jungle and forest and along its mountain ridges.

*A Carib woman husking coconuts.*

POLYPHEMUS MOTH

## GIANT SILKWORM MOTHS

Photographs and Notes by W. V. CRICH

IN ONTARIO we have a number of giant silkworm, or night-flying, moths. Because of their large size and beautiful colours, they are a collector's delight. The antennae are large and feathered, those of the male being feathered to the tip and always larger than those of the female. These moths go through a complete metamorphosis in their development from egg to adult. The adult moths lay their eggs on trees and shrubs, the leaves of which will later become the source of food for the larvae. Each species has its own peculiar taste, and an abundant food supply is necessary for the development of these larvae to their maximum size of from two to four inches in length. When fully developed, the larvae spin cocoons, which enclose the pupae. These silken cocoons act as a protective coating against storms, temperature changes, and moisture. Their drab, colourless covering helps also to disguise them from their enemies, the birds. The most common of the night-flying moths include:

(1) The Polyphemus Moth (*Telea polyphemus*)
(2) The Luna Moth (*Tropoea luna*)
(3) The Cecropia Moth (*Samia cecropia*)

## CECROPIA MOTH *(Above)*

*Samia cecropia*

THE large, beautiful cecropia moth is the most widely distributed of the moths. It ranges from the Atlantic to the Great Plains. Acceptable food for the larvae of this moth include the leaves of the willow, the maple, and the apple. The eggs, therefore, are laid on these trees, where they soon hatch and feed upon the leaves. The larva is about four inches long when ready to pupate, and is green with bluish tints. Two rows of blue tubercles protrude along each side, with two rows of yellow ones along the back and two pair of red ones on the thorax. It spends its pupal stage in a large, pod-shaped cocoon. These cocoons are about one inch in diameter and measure from 2½ to 3 inches long. If cut open, they have the appearance of one cocoon inside another. Between the outer tough layer and the inner firm layer enclosing the pupa is an area of loose silk threads which make the cocoon wall very thick. At one end is a small opening closed only by a mass of loosely woven silk, which aids the moth in emerging from the cocoon. These cocoons are securely attached to branches and may remain there for a whole season or longer after the adult has emerged.

The adult moth has its head, body and the bases of the fore-wings coloured in rich red interspersed with white bands. The wings are a reddish-brown, with white or reddish crescents bordered with red and black.

## POLYPHEMUS MOTH *(Previous page)*

*Telea polyphemus*

THE adult polyphemus moth is ochre in colour. Each wing has a transparent spot which on the hind wing is bordered by blue surrounded by a black ring.

In the larval stage it feeds on a great variety of trees, including willow, oak, birch, beech, basswood, and maple. The larvae are the colour of the leaves with raised lines of silvery white along the sides. When disturbed they assume a "terrifying attitude" by elevating the front part of their body and pulling in their heads.

The cocoons of this species are fairly common and in the autumn are found on willow and orchard trees where the larvae have been feeding. A few leaves aid the larva in forming the cocoon's outer covering. These leaves are blown down by the wind in the autumn. The cocoon contains a long, unbroken thread of silk which would be of commercial value if cheap labour were available. In size the cocoons measure 1½ inches in length and three-quarters of an inch in diameter.

## LUNA MOTH *(Below)*

*Tropoea luna*

THE luna moth shown in the accompanying photograph was first seen on a pine tree. It was shown up by the headlights of our car as we were driving along a country road. We applied our brakes and examined the specimen by the car lights. No camera was at hand, but the specimen was still wet, and had evidently just emerged from its cocoon. As we considered it worthy of a photograph, we went home for our camera and returned to find the moth in the same place, and just ready to take off.

The specimen was an early spring adult and had purple outer margins on the wings. Adults appearing later on in the year lack this purple coloration. The beautiful green colour of this moth when it has freshly emerged soon fades to a light, grey-green and it becomes less beautiful, but it is still considered by some people to be our most beautiful insect.

The eggs are laid upon a number of trees, the walnut and hickory in Ontario, and further south on the sweet gum, persimmon, and others. The larvae, when hatched, feed voraciously on the leaves of these trees until they have developed to about three inches in length. When it is time for the larva to pupate, the yellow-green of the back becomes pinkish. The cocoon is very thin and papery. It is spun either between leaves on the ground, or among leaves on the tree; and when the leaves fall to the ground later in the autumn the cocoon falls with them and there it generally passes unnoticed.

This moth has quite an extensive range, from Canada to Florida and westward to Texas.

U.S. Forest Service

# A Geologist Looks at the Quetico-Superior Area

*by* WALLACE W. ATWOOD
President Emeritus, Clark University.

The lands between Lake Superior and the Lake of the Woods adjoining the route of the pioneer voyageurs, which have been proposed for a memorial international forest are of special interest to students of the out-of-door sciences and all lovers of a charming wilderness area.

Here is an area about 175 miles long from east to west and of variable width up to 100 miles containing approximately 16,000 square miles where at least forty per cent of the surface is covered by lake waters and connecting streams and where the disarrangement of drainage due to intense glaciation presents an intriguing puzzle to the physiographic geologist. It is also one of the most attractive of the more accessible wilderness areas in the continent; a paradise for canoemen and fishermen; a delightful retreat for all who would like a change from the crowded industrialized or conventionalized urban centres. The region provides an opportunity for enjoying one of the finest wilderness lakelands on the continent, a labyrinth of waterways.

*At top:—Part of Lake Kekekabic in Superior National Forest.*

U.S. Forest Service

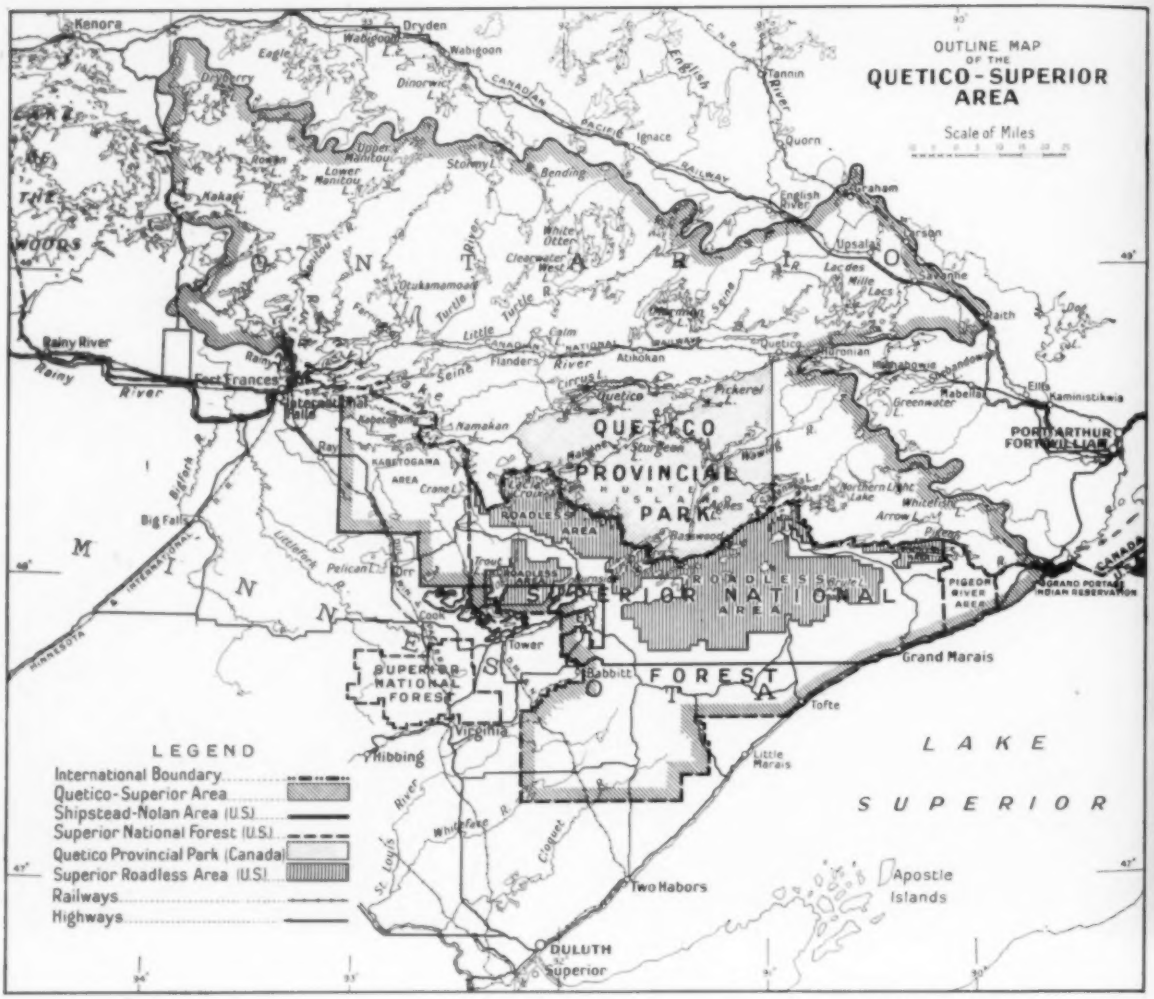
*Aerial view of Lake Insula from the west, in Superior National Forest—part of the lakeland wilderness.*

Here the geologist finds exposed at the surface the roots or stumps of very ancient Precambrian mountain ranges. The rocks are granites, gneisses, schists, greenstones and basaltic intrusions. This is a region where rock masses five to ten miles in thickness, that were folded, broken and crushed during mountain making movements, have been removed by erosion and washed into inland seas to form sandstones, conglomerates and shales that mantle much of the interior of the continent.

During the long erosion period when the ancient mountains were removed the streams reduced the surface of the land to a rolling plain not much above sea level. If, today, in imagination we fill the lake basins and hollows to the monotonously even summit level of the hill tops we reproduce that old erosion surface, a peneplain.

Later this region was uplifted and the rejuvenated streams dissected the gently rolling surface developing a drainage pattern with major valleys and many smaller tributary stream courses.

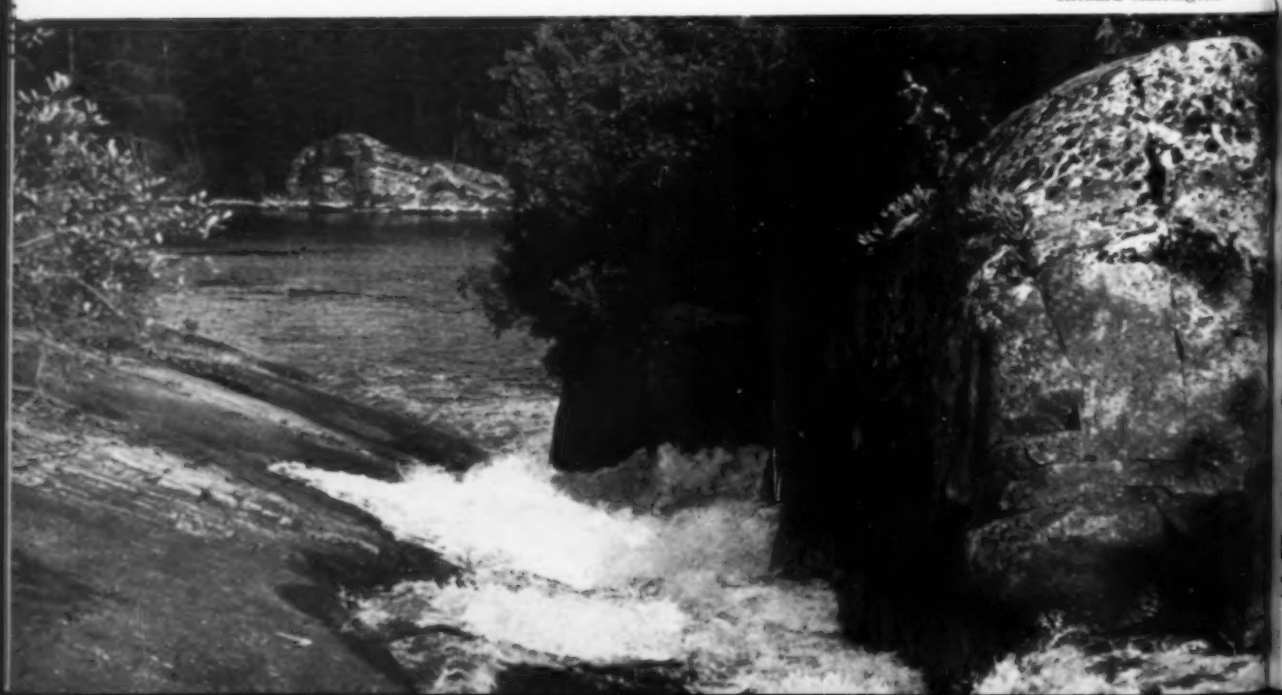
During two days while surveying this wilderness area from the air, crossing back and forth so as to see the topography from various angles and from various elevations, it became clear that the pre-glacial valleys have been obliterated. Nothing was observed that resembled a gully or a valley depression which by headward erosion was becoming longer. No tributary streams were observed




Canadian Geographical Journal map

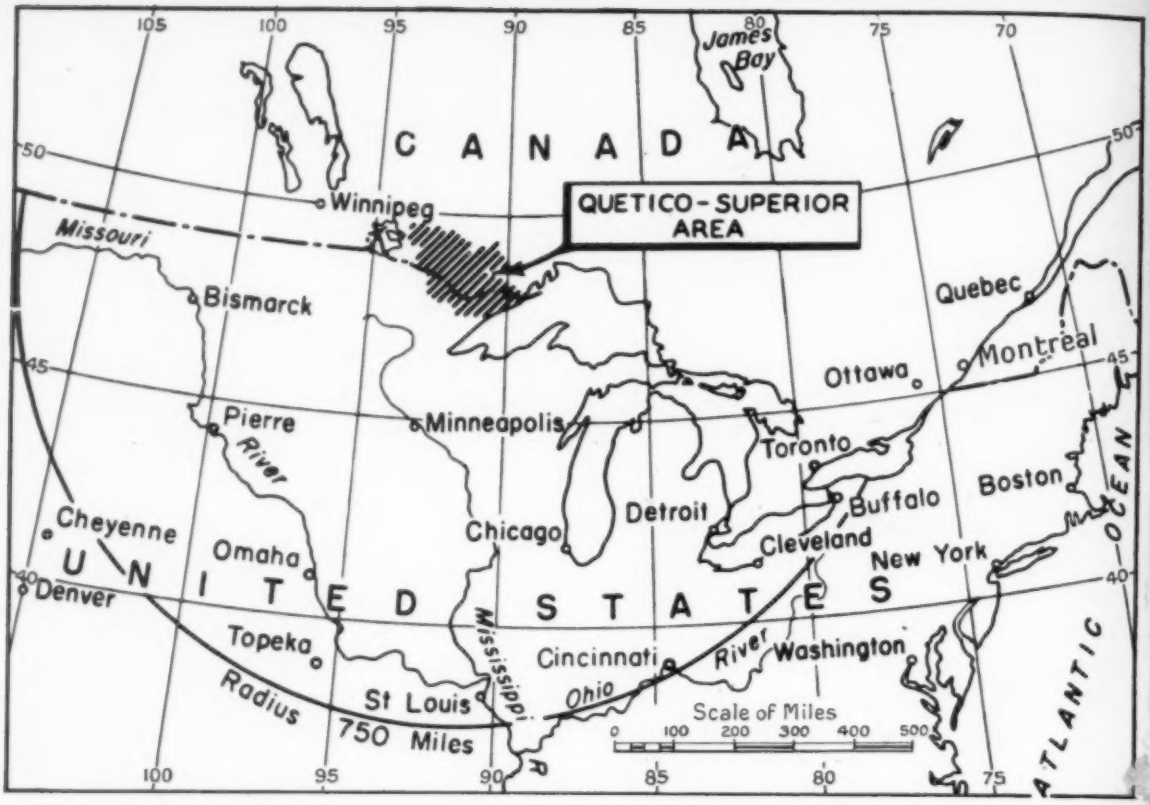
*Rebecca Falls, one of the beauty spots in Quetico Provincial Park.*

Richard Harrington



*Basswood Falls* Richard Harrington


*A small section of the Quetico-Superior area on both sides of the International Boundary showing the lakes and streams that have been mapped.*




*Some forty-three million people live within a radius of 750 miles of the Quetico-Superior area.*

that joined the main streams in depressions which they had made. The streams that were observed appear to be flowing on the floors of old lake basins or in joint plains in the ancient formations where the glacial ice has easily removed the crushed and broken rock material. They are not in depressions which they have made and therefore not in true valleys.

The aerial study emphasized this interpretation as no amount of work at the lake or land level could have done. Probably this same interpretation of drainage conditions will hold for most of the Canadian Shield and for the drainage conditions in Finland and other sections of Northwest Europe. Certainly the present drainage pattern in Quetico-Superior Wilderness Area in no way resembles the normal pattern of valleys developed by streams.

When a lake overflows at some point in the rim of its basin, the waters find a way to another lake or they may join a larger or smaller stream that was caused in the same way. Then those waters may soon become ponded and a lake at a lower level is found. That lake may have no visible outlet. Thousands of incidents like these must have occurred. A tiny rivulet may be in a large open depression for 100 yards or so and then plunge into a narrow rock gorge. Rapids and waterfalls are numerous in most stream courses. The lakes are at various levels. The drainage routes are a tangle of streams flowing in every possible direction.

Physiographers have commonly referred to the drainage of glaciated regions as "disarranged". They have recognized large streams in small valleys and small streams in large valleys. This is strikingly true in New England. There, for example, the Androscoggin River occupies parts of several pre-glacial river-made valleys. Pre-glacial valley depressions can be easily recognized in many areas that have been invaded by continental ice sheets but in this wilderness area the true valley depressions that must have existed appear to have been completely erased.

The present topography can, with complete satisfaction, be explained by ice work. Ponding of drainage by glacial deposits

*Top right:—Painted Rock at Lac la Croix on the International Boundary.*
Richard Harrington

*Bottom right:—This huge rock mass by Basswood Lake testifies to the wearing and scoring of the rock-shod glacier which passed for thousands of years over this wilderness area.*
Richard Harrington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45
OCEAN
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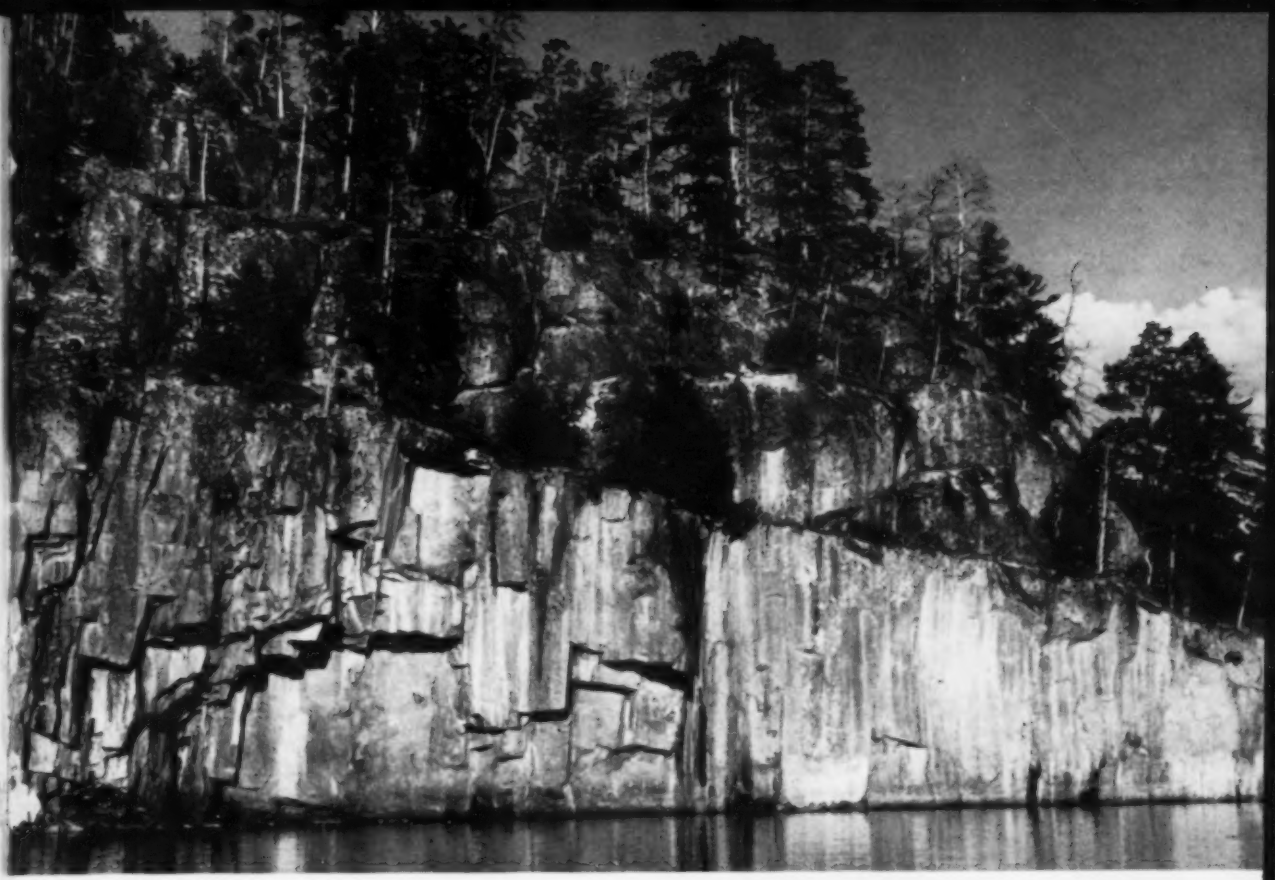

is common thoughout the area. The ice has gouged out holes in the rocks that range up to several hundred feet in depth and vary in size from a few acres to thirty or forty square miles. Many of the ice-made depressions are filled with moraines, others by shallow lakes. Smoothed, polished and striated surfaces appear on many of the rocky islands.

The old pre-glacial valleys are gone or so modified that they cannot be recognized as stream-made depressions; the normal patterns of major streams with tributaries are missing; some of the longer lakes may occupy old valleys but they may be in depressions due to ice-gouging. Hundreds of islands in the lakes are but the tops of rocky crags that the ice failed to remove; they are not features of pre-glacial valleys.

This is a region where intense ice action took place during at least four distinct glacial epochs. The ice that moved over this region was certainly more than a mile thick and it once moved as far south as central Missouri, another time into northeast Kansas and later into central Iowa. Each sheet of ice that moved over this wilderness area of today must have continued in motion for hundreds of thousands of years. It always moved forward, never backward. All of the time during which the ice fronts were retreating from Missouri, Kansas or Iowa to this locality, the ice in the great continental glacier was moving forward as a huge rock-shod rasp scraping off soils, sub-soils and solid rocks. Much of the rich soil material in the northern states came from Canada where rock decay and all soil-making processes had been going on for thousands, possibly millions, of years.

In the Quetico-Superior district there is so little soil that the production of field crops could not be carried on profitably. Much of the land is under lake waters or in marshes. Other large sections have no soils. The bare rock is at the surface. When surveyed from the air the extent of bare rock surfaces is distinctly impressive. What soils there are are thin and discontinuous.

Many of the trees and shrubs that do live here send their roots into cracks and crevices in the rocks. They represent the best nature could do in that region during the thousands of years since the last glacial ice melted away. Some of them, that fortunately became located where there was soil, are large enough to produce lumber but most of the present forest trees are small.

The trees and shrubs add much to the beauty of the landscape and it is to the credit of those who have received permits to cut that they have left the trees on the slopes facing the lakes. While boating on the lakes most of the surrounding forested lands appear to be in their primeval state of preservation.

The proposal to set this land aside as an International Memorial Peace Forest is in keeping with the best practice in conservation. It will be making the best possible use of the area for the people of Canada and the United States. About 43,000,000 people live within a radius of 750 miles of this wilderness and thousands of them as well as many from more distant parts will certainly appreciate the preservation of a portion of the natural beauty in the landscape of this lakeland which we have inherited and enjoyed.

This project falls most appropriately into line with the best in forestry practice in conservation and in the policy now well established in Canada and the United States of preserving unharmed, for posterity, some of the places in the natural landscape of unusual charm and of scientific, educational and spiritual significance.

*Right:—In Quetico Provincial Park, Ontario.*
Richard Harrington

## EDITOR'S NOTE-BOOK

Lorne Manchester is a native of Ottawa. For twelve years he worked on an Ottawa newspaper except for a break of four years military service, when he served in the army in Canada and overseas, being discharged with the rank of captain. Early in 1948 he joined the Department of Fisheries as writer and editor and since then has travelled to the east and west coasts to study fishing operations at first-hand.

* * *

E. O. Hoppé's vocation — photography — has taken him to many parts of the world and his wide interests are shown, and shared, in his articles about many lands and many peoples. Mr. Hoppé's photographs have been widely exhibited and have done much to gain for photography recognition as an art form. Mr. Hoppé, who was born in Germany and educated in Paris and Vienna, lives in England.

* * *

### ERRATUM

May issue, page 211: in the picture of Steep Rock Lake (A), the caption should have read "six of the seven steel barges which carried fourteen pumps". Each barge carried two pumps, not fourteen.

PRESENTING THE NEW

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## AMONGST THE NEW BOOKS

### Polar Exploration

*by Andrew Croft*

(Macmillan, Toronto, $4.00)

"*So thin is the line which divides success from failure.*" Shackleton had ample cause for such comment. His ship, the *Endurance*, frozen in the ice off the Antarctic Coast, had drifted helplessly with the field for nine months, until in October 1915 she was crushed and sunk. The drift had carried her through some 1,200 miles (573 miles as the crow flies), but the nearest shelter was still 312 miles away. The men were held encamped on the ice for a further five and a half months before conditions permitted them to launch the lifeboats between breaking floes and reach the safety of Elephant Island. From this isolated shore the only hope of rescue was to reach South Georgia, across 800 miles of the world's stormiest ocean. With five men in a twenty-two and a half foot lifeboat Shackleton tackled this perilous journey. Again and again their fate hung in the balance as the little craft was driven by freezing gales through engulfing seas. And then, as if to end the cat-and-mouse game after a miracle of fortitude and skilful navigation had brought them within sight of their goal, a violent hurricane sprang up and for thirteen hours of terrible struggle seemed certain to dash them against that rocky coast. Only another shift of wind, as sudden as before, at last made landing possible.

Such desperate odds, such hazarding of life upon the thinnest chance, seem the rule rather than the exception in the annals of polar exploration. And though the toss was lost as often as not, frequently the failure has availed more than the specious success for which it paved the way. Andrew Croft's important purpose is "to separate chance from modesty, and to give an impartial account of what actually took place". He examines the more prominent expeditions of the present century "to show the progress made by the individual leaders, their differences in technique, and their contribution towards the general trend of polar exploration".

To his difficult task Andrew Croft brings a critical judgment enabled by wide experience. Personally acquainted with many of the explorers of whom he writes, he has himself engaged in every phase of Arctic exploration, notably in Lindsay's great sledge journey across Greenland in 1934 and in Glen's expedition to the ice-cap of Spitzbergen's North East Land the following year. His experience properly belongs in the great era of discovery whose final curtain rang down less than twenty years ago. Only then did wireless and 'plane come into general use in the Arctic, not eliminating the perils it is true, but immeasurably reducing

(*Continued on page IX*)

(*Continued from page VIII*)

them, and so transforming the very elements of time and distance that the whole character of the work was completely altered. Then, to, the first three decades of the present century had seen the last unknown frontier mapped, at least in outline, so that future efforts must turn to more detailed investigation. Scientific endeavour, long the stepchild of discovery, was coming into its own.

The breadth of the author's survey has forced him (as he points out in his preface) to ignore much of the concomitant scientific work. But his knowledge of that work is always present, underlying and illuminating his judgments. It joins with his interest in methods and techniques to strengthen immensely the continuity of his narrative. Each expedition appears not as an isolated event but as a step along the common road. Some of the steps are longer than others, some lead away from the main track, but each widens the known way and forms part of the succession. We see individual men, too, develop from apprenticeship in one venture to leadership in another, many of them not confining their efforts to one hemisphere but carrying their experience from one polar ocean to the other, and back again.

These men emerge as almost superhuman beings. Sometimes they seem like the ancient Greek heroes to be pursued by a jealous god bent on thwarting them, sometimes they seem to snatch the victory back by sheer force of will. In tales as stirring as Shackleton's the events carry their own impact. Andrew Croft's laconic prose is exactly right for their telling. He pictures clearly the aims and difficulties of each expedition, makes us *feel* the landscape and climate, the unpredictable treacheries of weather and terrain. He reveals the inner feelings of men battling unfathomable, unknown dangers, the strain under which they worked, and we come to know the strange impersonal spirit which possessed and impelled them.

The author's power of re-creating the event appears even in the historical introductions (masterpieces of condensation), but shows best in the longer passages relating to the South Polar search. I could wish such obvious and unique capabilities employed in a more integral work. Would Mr. Croft please give us the biography, at once popular and authoritative, that is needed to rescue from semi-oblivion any one of the great names sprinkled across Arctic islands or Antarctic wastes? There is ample material, the choice is wide: shall it be Parry or Ross, Franklin, McClintock or Rae, Nansen or Stefansson, Mawson, Shackleton or Scott?

I do not think it out of place here to mention the fine and quite unsentimentalized film "Scott of the Antarctic" recently released by the British studios. Professor Griffith Taylor of Toronto, a member of Scott's expedition, has attested its complete authenticity, saying that the actors even look and behave like the people they represent. Readers of *Polar Exploration* will be impressed by the extraordinary fidelity of the film to Andrew Croft's account of this glorious, doomed venture.

Wartime paper restrictions prevented wider distribution of the first edition of *Polar Exploration*, published in 1939. A few minor additions have been made to this second edition to bring it up to date, including a brief reference to the Canadian military exercise "Musk-Ox", which the author accompanied as British observer. Many of the fine photographs illustrating the text are the author's own. The maps are adequate, but it is a serious handicap to the reader not to have them folding outside of the printed pages for uninterrupted reference while reading the text. This defect should be remedied in future printings of this valuable work.

WALLACE R. JOYCE

* * *

### Our Summer with the Eskimos

*by Constance and Harmon Helmericks*

(McClelland & Stewart, Toronto, $4.00)

The coast line between the mouth of the Mackenzie River and Point Barrow, and the country lying inland between these two points, are among the least known areas of the north west. The few white visitors to the area have usually arrived by ship or, in recent years, by plane and the Helmericks, in approaching it from inland, travelling down the Colville River, did something that few white men, and probably no white woman, have done before. There are very few descriptions of this route and their observations have definite value for this reason. True, they have not told us anything which did not fit well with what was suspected before, nor have they denied any accepted facts which they found to be erroneous. However, confirmation from a careful first hand source is now available and its importance can not be denied.

One feels at times that their material is a little thin; that there are too many descriptions of essentially similar scenes, but they all contribute to the general impression of the area and enable us to see it as they did. The recent account of Barrow and Point Barrow are valuable and tell us something of the large scale development of the oil resources which are taking place there now.

Their accounts of hunting the *ugrug*, the great bearded seal, are interesting, as are those of caribou hunting. Clothes are made from the skins of the caribou, and this type of garment is far superior to white men's clothes of woollen cloth in the experience of the Helmericks.

They meet and learn to appreciate the Eskimos, who are thinly scattered over this immense area, usually living on the coast and going inland when hunting caribou. There are only about 250 of them in an area of some 60,000 square miles.

As in previous books by the Helmericks one cannot escape a feeling of irritation at the apparent scantiness, if not actual inadequacy, of their equipment and preparations. Courage and common sense will carry one a long way in the North as elsewhere, but inadequate preparation for a long and possibly dangerous trip is neither courageous nor sensible.

DOUGLAS LEECHMAN.